

ABSTRACT

Provided herein are methods for measuring wave aberrations of the eye.

Retinal scattered radiation from a probing laser beam is detected, the wave front tilt is measured as first partial derivatives along known coordinates in a discrete set of the pupil points, the wave front is approximated from this data as functions of the pupil coordinates and the wave aberrations of the eye are thereby calculated. Partial derivatives are determined at any pupil point by spline approximation using the values in a discrete number of points in which the wave front tilts are measured. This set of points may be located along concentric circles or along one of the orthogonal axes. The wave front is reconstructed using numerical integration along the radii with the initial integration point in the center of the pupil. Wave aberrations are calculated from wave front data reconstructed in the form of splines.